

WHAT IS CLAIMED IS:

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- 1 A method of treating comminuted cellulosic fibrous material
- 2 utilizing a star feeder having a rotor with a plurality of pockets rotatable
- 3 within a cylindrical housing with an inlet and an outlet, a clearance
- 4 between the housing and the rotor, and a shear edge in the inlet at a
- 5 downstream portion of the inlet in the direction of rotation of the pocketed
- 6 rotor; said method comprising the steps of:
- 7 (a) feeding comminuted cellulosic fibrous material into the inlet;
- 8 (b) rotating the pocketed feeder to accept comminuted cellulosic
- 9 fibrous material from the inlet and to carry the material past the shear
- 10 edge to the outlet;
- 11 (c) discharging the comminuted cellulosic fibrous material from the
- 12 pocketed rotor through the outlet;
- 13 (d) when the shear edge is worn to approximately the point that
- 14 excess leakage occurs or is substantially imminent, replacing the shear
- 15 edge with a new shear edge while the practice of steps (a)-(c) is
- 16 interrupted; and
- 17 (e) repeating steps (a) through (d).

- 1 2. A method as recited in claim 1 wherein the shear edge is held in
- 2 place by readily removable fasteners; and wherein step (d) is practiced by
- 3 removing the fasteners, removing the entire shear edge which was held
- 4 on by the fasteners, replacing the entire shear edge, and holding the
- 5 replaced shear edge in place with the fasteners.

- 1 3. A method as recited in claim 2 wherein the shear edge is
- 2 provided by outer and inner shear plates which are attached by the

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3 fasteners in a stack; and wherein step (d) is further practiced by
 4 unfastening the fasteners, changing the positions of the outer shear plate
 5 and inner plate, and reattaching the fasteners.

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~~4.~~ A method as recited in claim ~~3~~ ² wherein the fasteners are screw
 2 threaded fasteners which cooperate with internally threaded bores in the
 3 star feeder housing; and wherein step (d) is practiced by unscrewing the
 4 fasteners to remove the shear plate, and screwing the fasteners back into
 5 the threaded openings to re-attach a new shear plate.

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~~5.~~ A method as recited in claim ~~4~~ ³ wherein step (d) is practiced
 2 utilizing a shear plate which has a shear edge with hardness properties at
 3 least 10% greater than the hardness properties of the housing.

1 6. A method as recited in claim 2 further utilizing a removable
 2 protective baffle mounted in the housing inlet in a position above the
 3 shear edge, providing protection for the shear edge; and comprising the
 4 further steps of (f) readily removing the protective baffle prior to detaching
 5 and replacing the shear plate, and (g) after replacing the shear plate,
 6 reinstalling a protective baffle.

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~~7.~~ A method as recited in claim ~~6~~ ¹ wherein the protective baffle is
 2 held in place by screw threaded fasteners extending into and through the
 3 star feeder housing; and wherein steps (f) and (g) are practiced by
 4 unscrewing the screw threaded fasteners holding the protective baffle in
 5 place, and re-screwing the fasteners back into place once the shear plate
 6 has been replaced; and positioning the protective baffle so that it engages
 7 at least one fastener for the shear plate.

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 8. A method as recited in claim ~~2~~ wherein step (d) is practiced by
 2 rotating the shear plate approximately 180° about a horizontal axis so as
 3 to provide a new shear edge; and reinstalling the same shear plate with a
 4 new shear edge.

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 9. The method as recited in claim 1 wherein step (c) is practiced in
 2 part by utilizing a steam purge, and then exhausting the steam from the
 3 pocketed rotor after the steam is purged.

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 10. A method as recited in claim 1 wherein the shear edge is
 2 provided by a distinct shear plate adjustably mounted with respect to the
 3 housing so that the position of the shear edge with respect to the
 4 pocketed rotor can be adjusted; and wherein step (d) is practiced by
 5 adjusting the position of the shear edge so that it is closer to the pocketed
 6 rotor.

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 11. A method as recited in claim ~~10~~ wherein the shear plate is
 2 adjustably mounted to the housing by a plurality of screw threaded
 3 fasteners received by internally screw threaded openings in the housing,
 4 and passing through a plurality of elongated slots in the shear plate, the
 5 slots elongated in a substantially radial dimension; and wherein step (d) is
 6 practiced by loosening the screw threaded fasteners, adjusting the
 7 position of the shear plate by sliding the shear plate so that the elongated
 8 openings move with respect to the fasteners with the shear plate guided
 9 by the fasteners in the elongated openings, and tightening the fasteners.

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12. A method of refurbishing a star feeder in a pulp mill, the star feeder having a cylindrical housing with an inlet and outlet, a pocketed rotor disposed within the housing and having a clearance with respect thereto, and rotatable about an axis within the housing, and a shear edge formed in the inlet at the portion thereof closest to the rotor at the most downstream portion of the inlet in the direction of rotation; said method comprising the steps of:

- (a) stopping rotation of the pocketed rotor;
- (b) cutting out the shear edge to form a recess in the housing;
- (c) forming fastener receiving openings in the housing adjacent the recess;
- (d) installing a shear plate in the recess, the shear plate having a shear edge, fastening the shear plate to the housing with fasteners extending into the fastener receiving openings so that the shear edge of the shear plate is adjacent where the original shear edge of the housing was, and so that it functions to minimize entry of material into the clearance between the rotor and the housing, and to shear any large material that attempts to enter the clearance; and
- (e) restarting operation of the star feeder.

13. A method as recited in claim 12 wherein step (d) is practiced by placing first and second plates, in a stack, in the recess.


14. A method as recited in claim 13 comprising the further step (f) of when the shear edge on the shear plate becomes worn, loosening the fasteners, replacing the shear edge, and tightening the fasteners.

1 15. A method as recited in claim 12 comprising the further step (f)
 2 of when the shear edge on the shear plate becomes worn, loosening the
 3 fasteners, replacing the shear edge, and tightening the fasteners.

1 16. A method as recited in claim 12 wherein the inlet includes a
 2 protecting baffle for protecting the shear edge from large particles and
 3 tramp material; and comprising the further steps of: (g) removing the
 4 protective baffle; (h) forming a plurality of openings in the housing past
 5 the inlet adjacent where the protective baffle is removed; and (i) fastening
 6 a replaceable protective baffle to the housing using fasteners passing into
 7 the openings formed in step (h).

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 1 17. A star feeder assembly comprising:
 2 a generally cylindrical housing having an interior and an inlet and
 3 outlet cooperating with the interior;
 4 a pocketed rotor mounted in said interior and rotatable in a
 5 direction of rotation with respect to said housing so that each pocket
 6 thereof, during rotation, moves from a position in communication with said
 7 inlet to a position in communication with said outlet, in a direction of
 8 rotation thereof; said rotor and housing interior having a clearance
 9 therebetween;

10 a shear edge disposed adjacent said clearance in the
 11 downstreammost portion of said inlet, in said direction of rotation; and
 12 said shear edge mounted so that it is readily replaceable.

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 1  18. An assembly as recited in claim 16 wherein said shear edge
 2 comprises an edge of a plate; and wherein said plate is mounted to said

3 housing by a plurality of fasteners so that said plate is readily movable or
4 replaceable.

1 ¹²~~19~~ An assembly as recited in claim ¹¹~~18~~ wherein said plate includes
2 a plurality of elongated openings therein extending in a dimension toward
3 said clearance; and wherein said fasteners are disposed in said
4 elongated openings and upon loosening of said fasteners said plate is
5 movable with respect to said fasteners, said elongated openings sliding
6 with respect to said fasteners; and upon tightening of said fasteners said
7 plate is secured in place with respect to said housing with said shear
8 edge thereof properly positioned with respect to said clearance.

1 ¹³~~20~~ An assembly as recited in claim ¹⁰~~17~~ wherein said shear plate,
2 at least at said shear edge thereof, is made of material having a Brinnell
3 Hardness at least 10% greater than the hardness of said housing, and
4 between about 350-450.

1 21. An assembly as recited in claim ¹⁰~~17~~ further comprising a readily
2 replaceable protective baffle disposed above said shear edge to protect
3 said shear edge from large particles and tramp material.

1 ¹⁴~~22~~ An assembly as recited in claim ¹⁷~~21~~ wherein said protective
2 baffle comprises a mounting portion having a plurality of through
3 extending openings therein; and wherein said housing has a plurality of
4 through extending openings cooperating with said openings in said
5 protective baffle mounting portion; and further comprising a plurality of
6 fasteners passing through said mounting portion opening and said
7 housing opening to releasably hold said protective baffle to said housing.